The Solution of Plato

Page 263 Greek Mathematics Vol. 1, Ivor Thomas, Loeb Classical Library

While in the process of editing *Xenophon to Plato in the Nude*, I was also getting my source documents up to snuff also, so that anyone could double check anything by going back to the original printed source in case something just ain't right comes along. This, naturally, included sources from the Loeb Classical Library. In looking for a better copy of one of the volumes on the Internet Archive, I ran acrost a source which had over 500 volumes of the Loeb Classical Library, but I did not want them all, just the dialogs of Plato. Now, you can download, or are supposed to be able to, download individual files from the zipped file, which I did. However, two volumes turned out to have zero file length. Now, I tried them again, same result. In order to trace down the problem, I had to do what I did not want to do at the time, I had to download the twelve gig plus file anyway. The fault was not in the file. It was in trying to do something over the wire, so to speak, as if you actually had the file, it almost works and so, you might, as I did, hit a dead zone. I decided to see if Euclid was mentioned in any title of the Library, and the result was one volume entitle Greek Mathematics volume 1. I then decided to look on the Internet Archive for better copies of the two volumes, and I did find them, and made a boxed set of them which turned out nice. However, while making it, I noticed that Plato was mentioned, bringing me back to the first project I am working on. The piece is called The Solution of Plato, which was Plato's hint to the result of finding two mean proportionals. The piece aggravates me because, it shows how stupid Thomas was because he could not even figure out that Eutocius was attempting to show how it could be solved, which has nothing to do with what Plato laid down. Secondly, the math is not finished on it. The result in a duplicate ratio is not just one cube root, it is always two. Secondly, this figure has existed for over two thousand years and all the people bragging on how smart they, or someone else was, no one could adequately explain the figure. I call that stupid and arrogant. So, here is the write up given, and then I will redo it, ignoring Eutocian Mechanics, in accordance with actual math and geometry and show you Plato's meaning.

The Solution of Plato

Given two straight lines, to find two mean proportionals in continuous proportion.

Let the two given straight lines be ΑΒ, ΒΓ, perpendicular to each other, between which it is required to find two mean proportionals.

Right away, I have a complaint, why would anyone claim to be translating things into English, and then label his points in Greek? So, let me amend that:

Let the two given straight lines be AB, BC, perpendicular to each other, between which it is required to find two mean proportionals.

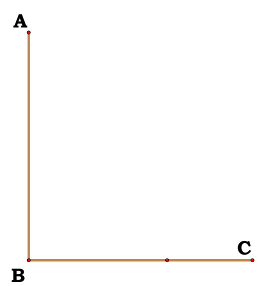
Let them be produced in a straight line to Δ, Ε, let the right-angle ΖΗΘ be constructed, and in one leg, say ΖΗ, let the ruler ΚΛ be moved in a kind of groove

in ZH, in such a way that it remains parallel to HΘ. This will come about if another ruler be conceived fixed to ΘH, but parallel to ZH, such as ΘM. If the upper surfaces of ZH, ΘM are grooved with axe-like grooves, a and there are notches on KΛ fitting into the aforementioned grooves, the motion of KΛ will always be parallel to HΘ. When this instrument is constructed, let one leg of the angle, say HΘ, be placed so as to touch Γ, and let the angle and the ruler KΛ be turned about until the point H falls upon the straight line BΔ, while the leg HΘ touches Γ, and the ruler KA touches the straight line BE at K, and in the other part touches A, so that it comes about, as in the figure, that the right angle takes up the position of the angle ΓΔE, while the ruler KΛ takes up the position EA.a When this is done, what was enjoined will be brought about.

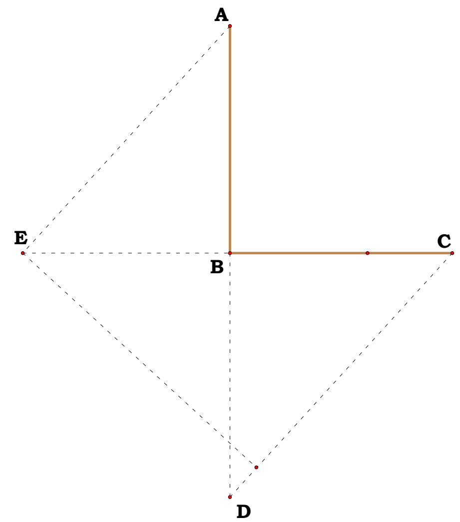
For since the angles at Δ, E are right, ΓB : BΔ = ΔB : BE = EB : BA. [Eucl. vi. 8, coroll.]

Now, one can ignore the contraption mentioned, and Thomas who declares, quite correctly that Plato had no interest in contraptions, but not that Eutocius' contraption meant anything about Plato's statement, or that Plato wrote his proof involving a contraption. So, I will do the demonstration over, in a more professional manner.

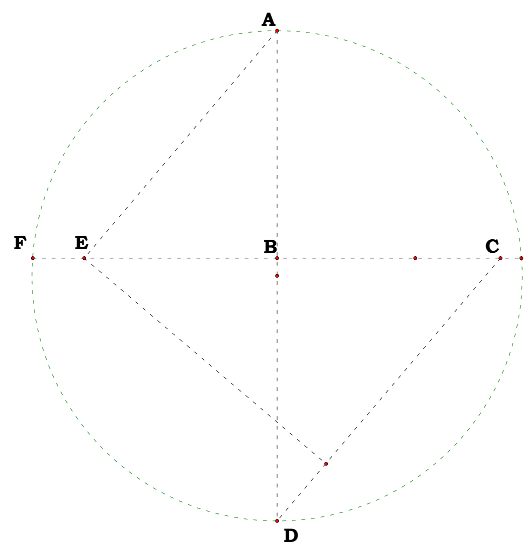
Given any two segments, to find two mean proportionals in continuous proportion.



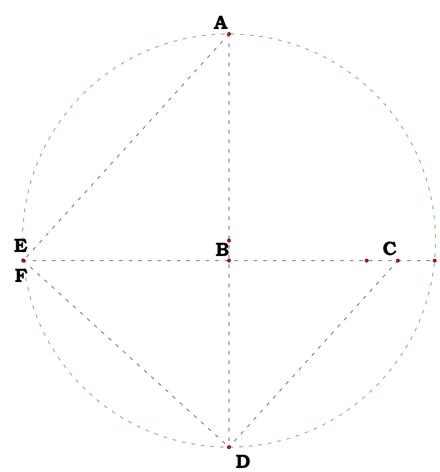
Let them be produced to D, E, such that CD is parallel to AE and A to CD is perpendicular to AE.



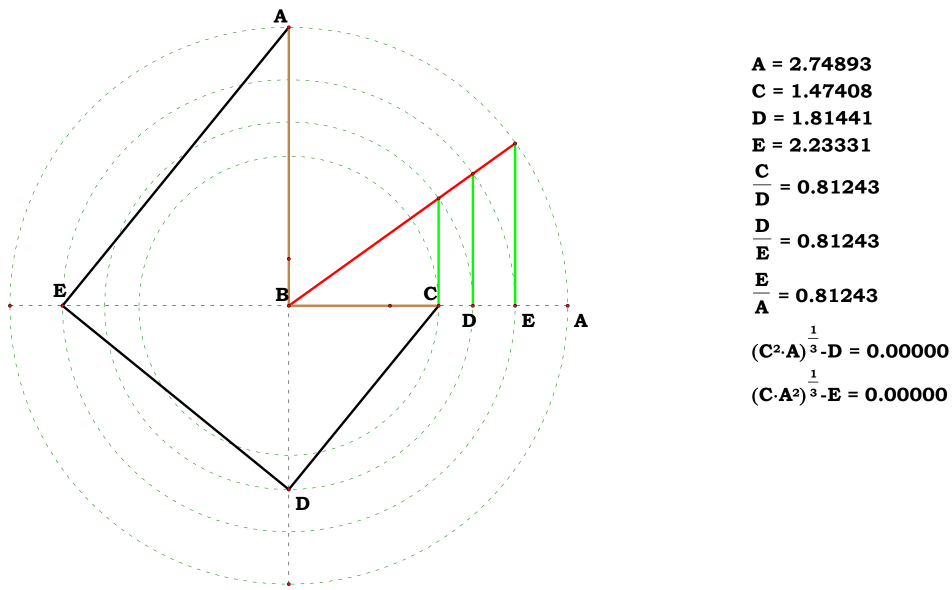
Draw a circle with AD as its diameter, and label point F.



By reducing the distance between EF, by moving E to F until they meet, one will produce the two segments sought.

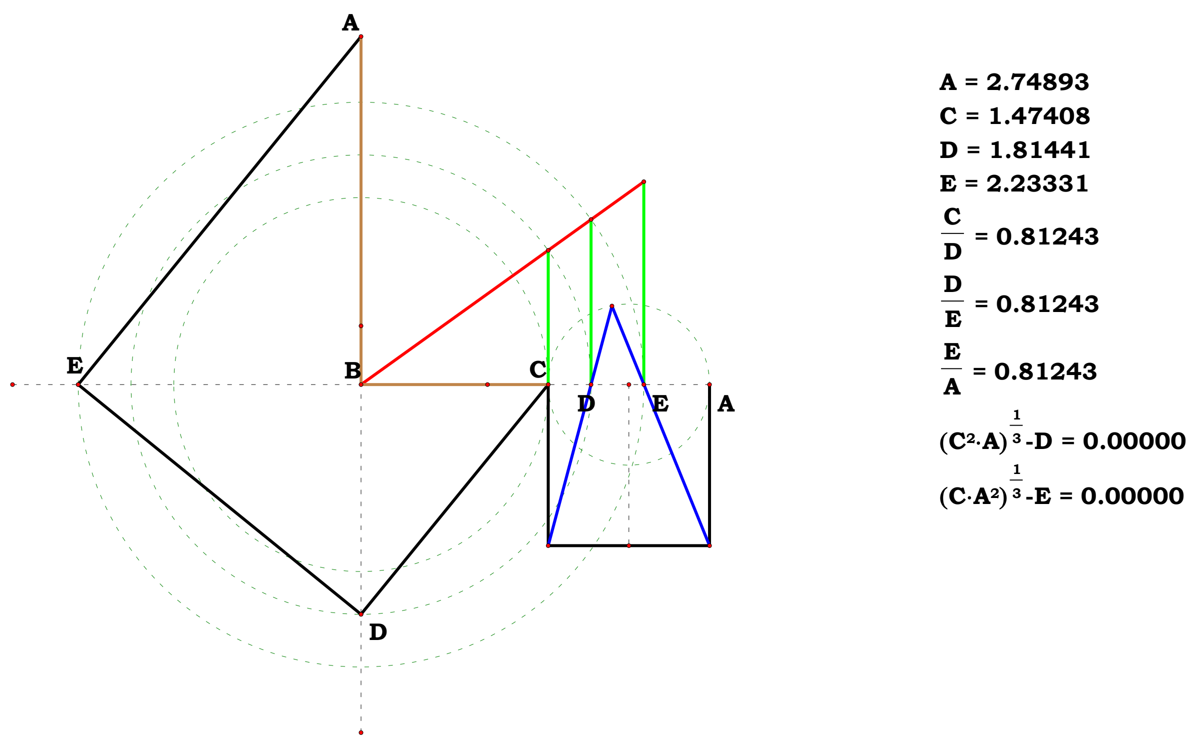


Now, we can place these magnitudes in continuous proportion as following and one will be able to see two cube roots:



Everything in this figure follows from what is given in Euclid.

One can now place a figure familiar to anyone who has read my Delian Quest.



I just became aware of this figure, as the footnote says, it is only mentioned one place in history. But it only took me a couple of minutes to write it up, so, what have all the big brains been doing for over 2,000 years in geometry? I find it being mentioned in the Loeb classics how great geometry is because it was the same in the 1800's as in Euclid's day. I would not brag about that, I would call

it historic stupidity. I find it rather pathetic that Ivor Thomas even mentions, and actually gets into the contraption, totally oblivious to what is in the simple figure.